

05/02

05/02

#7



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ENTERED

RAW SEQUENCE LISTING
PATENT APPLICATION: US/10/020,674

DATE: 05/02/2002
TIME: 15:37:07

Input Set : A:\06501-092001.TXT
Output Set: N:\CRF3\05022002\J020674.raw

4 <110> APPLICANT: Yamamoto, Hiroaki
5 Onodera, Keiko
6 Tani, Yoshiki
8 <120> TITLE OF INVENTION: NOVEL (R)-2,3-BUTANEDIOL DEHYDROGENASE
11 <130> FILE REFERENCE: 06501-092001
13 <140> CURRENT APPLICATION NUMBER: 10/020,674
C--> 14 <141> CURRENT FILING DATE: 2002-04-19
16 <150> PRIOR APPLICATION NUMBER: JP 2000-333363
17 <151> PRIOR FILING DATE: 2000-10-31
19 <160> NUMBER OF SEQ ID NOS: 17
21 <170> SOFTWARE: FastSEQ for Windows Version 4.0
23 <210> SEQ ID NO: 1
24 <211> LENGTH: 1143
25 <212> TYPE: DNA
26 <213> ORGANISM: Pichia angusta
28 <400> SEQUENCE: 1
29 atgaaagggtt tactttatta cggtacaaac gatattcgct actccgaaac ggttcctgaa 60
30 ccggagatca agaatccaa cgtatcaag atcaaagtca gctattgtgg aatctgtggc 120
31 acggacttga aagaattcac atattctgga gtcctgttt tttccctaa acaaggcacc 180
32 aaggacaaga ttccggata cgaacttcct ctctgtccctg gacatgaatt tagcggaaacg 240
33 gtggtcgagg ttggctctgg tgtcacaagt gtgaaacctg gtgacagagt cgcaagggtgaa 300
34 gctacgtcgc attgctccga cagatcgcgc tacaaggaca cggtcgccc agaccttggg 360
35 ctctgtatgg cctgccagag cggatctccg aactgctgtg cgtcgtcgag cttctgcgggt 420
36 ttgggtgggtt ccagggcggg ttttgcgag tacgtcggtt acggtgagga ccacatggc 480
37 aagctgccag actcgatcc cgacgatatt ggagcactgg ttgagctat ttctgttgcc 540
38 tggcatgtg ttgaacgcgc tagattccag cttgtcaga cggccctggg tcttggagga 600
39 gttcctatcg gccttgcac cattttgtct ctgcaaggcc atcatgcggg caaaattgtg 660
40 tttccggcgc cggccttgat cagaagacag tttgcaaaagg aactggggcgt tgaagtgttc 720
41 gatccttcta catgtgacga cgcataatgtc gttctcaagg ctatggcgc ggagaacgag 780
42 ggattccatg cagccttcga ctgtctgggt gttcctcaga cattcaccac ctcattgtc 840
43 gccacgggac cttctggaaat cggcgtcaat gtggccgttt ggggagacca cccaatttgg 900
44 ttcatgccaa tgtctctgac ttaccaggag aaatacgtca cggcgtccat gtgtcacacc 960
45 gtcaggact tccaggaatgttcaaggcc ttggaaatgtt gtcctatata tttggacaaa 1020
46 ggcgcgaaga tgattacagg caaagtccac ctaaaggacg gagtcgagaa gggctttaaa 1080
47 cagctgatcg agcacaagga gaacaatgtc aagatcctgg tgacgcccggaa cgagggttcc 1140
48 taa
50 <210> SEQ ID NO: 2
51 <211> LENGTH: 380
52 <212> TYPE: PRT
53 <213> ORGANISM: Pichia angusta
55 <400> SEQUENCE: 2
56 Met Lys Gly Leu Leu Tyr Tyr Gly Thr Asn Asp Ile Arg Tyr Ser Glu
57 1 5 10 15

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58 Thr Val Pro Glu Pro Glu Ile Lys Asn Pro Asn Asp Val Lys Ile Lys
59 20 25 30
60 Val Ser Tyr Cys Gly Ile Cys Gly Thr Asp Leu Lys Glu Phe Thr Tyr
61 35 40 45
62 Ser Gly Gly Pro Val Phe Phe Pro Lys Gln Gly Thr Lys Asp Lys Ile
63 50 55 60
64 Ser Gly Tyr Glu Leu Pro Leu Cys Pro Gly His Glu Phe Ser Gly Thr
65 65 70 75 80
66 Val Val Glu Val Gly Ser Gly Val Thr Ser Val Lys Pro Gly Asp Arg
67 85 90 95
68 Val Ala Val Glu Ala Thr Ser His Cys Ser Asp Arg Ser Arg Tyr Lys
69 100 105 110
70 Asp Thr Val Ala Gln Asp Leu Gly Leu Cys Met Ala Cys Gln Ser Gly
71 115 120 125
72 Ser Pro Asn Cys Cys Ala Ser Leu Ser Phe Cys Gly Leu Gly Gly Ala
73 130 135 140
74 Ser Gly Gly Phe Ala Glu Tyr Val Val Tyr Gly Glu Asp His Met Val
75 145 150 155 160
76 Lys Leu Pro Asp Ser Ile Pro Asp Asp Ile Gly Ala Leu Val Glu Pro
77 165 170 175
78 Ile Ser Val Ala Trp His Ala Val Glu Arg Ala Arg Phe Gln Pro Gly
79 180 185 190
80 Gln Thr Ala Leu Val Leu Gly Gly Pro Ile Gly Leu Ala Thr Ile
81 195 200 205
82 Leu Ala Leu Gln Gly His His Ala Gly Lys Ile Val Cys Ser Glu Pro
83 210 215 220
84 Ala Leu Ile Arg Arg Gln Phe Ala Lys Glu Leu Gly Ala Glu Val Phe
85 225 230 235 240
86 Asp Pro Ser Thr Cys Asp Asp Ala Asn Ala Val Leu Lys Ala Met Val
87 245 250 255
88 Pro Glu Asn Glu Gly Phe His Ala Ala Phe Asp Cys Ser Gly Val Pro
89 260 265 270
90 Gln Thr Phe Thr Thr Ser Ile Val Ala Thr Gly Pro Ser Gly Ile Ala
91 275 280 285
92 Val Asn Val Ala Val Trp Gly Asp His Pro Ile Gly Phe Met Pro Met
93 290 295 300
94 Ser Leu Thr Tyr Gln Glu Lys Tyr Ala Thr Gly Ser Met Cys Tyr Thr
95 305 310 315 320
96 Val Lys Asp Phe Gln Glu Val Val Lys Ala Leu Glu Asp Gly Leu Ile
97 325 330 335
98 Ser Leu Asp Lys Ala Arg Lys Met Ile Thr Gly Lys Val His Leu Lys
99 340 345 350
100 Asp Gly Val Glu Lys Gly Phe Lys Gln Leu Ile Glu His Lys Glu Asn
101 355 360 365
102 Asn Val Lys Ile Leu Val Thr Pro Asn Glu Val Ser
103 370 375 380
105 <210> SEQ ID NO: 3
106 <211> LENGTH: 10
107 <212> TYPE: PRT

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```

108 <213> ORGANISM: Pichia angusta
110 <400> SEQUENCE: 3
111 Lys Pro Gly Asp Arg Val Ala Val Glu Ala
112 1 5 10
114 <210> SEQ ID NO: 4
115 <211> LENGTH: 21
116 <212> TYPE: PRT
117 <213> ORGANISM: Pichia angusta
119 <400> SEQUENCE: 4
120 Ala Thr Ser His Cys Ser Asp Arg Ser Arg Tyr Lys Asp Thr Val Ala
121 1 5 10 15
122 Gln Asp Leu Gly Leu
123 20
125 <210> SEQ ID NO: 5
126 <211> LENGTH: 6
127 <212> TYPE: PRT
128 <213> ORGANISM: Pichia angusta
130 <400> SEQUENCE: 5
131 Phe His Ala Ala Phe Asp
132 1 5
134 <210> SEQ ID NO: 6
135 <211> LENGTH: 20
136 <212> TYPE: DNA
137 <213> ORGANISM: Artificial Sequence
139 <220> FEATURE:
140 <223> OTHER INFORMATION: Artificially synthesized primer sequence
W--> 142 <221> NAME/KEY: misc_feature
143 <222> LOCATION: 6, 9, 15, 18
144 <223> OTHER INFORMATION: n = a, c, g, or t
W--> 146 <400> 6
W--> 147 aarccnngng aymgngtngc 20
149 <210> SEQ ID NO: 7
150 <211> LENGTH: 20
151 <212> TYPE: DNA
152 <213> ORGANISM: Artificial Sequence
154 <220> FEATURE:
155 <223> OTHER INFORMATION: Artificially synthesized primer sequence
W--> 157 <221> NAME/KEY: misc_feature
158 <222> LOCATION: 9, 12
159 <223> OTHER INFORMATION: n = a, c, g, or t
W--> 161 <400> 7
W--> 162 tcrtcraang cngcrtgraa 20
164 <210> SEQ ID NO: 8
165 <211> LENGTH: 530
166 <212> TYPE: DNA
167 <213> ORGANISM: Pichia angusta
169 <400> SEQUENCE: 8
170 aagccgggtg atcgtgtcgc agttgaagct acgtcgatt gctccgacag atcgcgtac 60
171 aaggacacgg tcgccccaga ccttgggctc tgtatggctt gccagagcgg atctccgaac 120

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172	tgctgtgcgt cgctgagctt ctgcggttt ggtggtccca gcggcggtt tgccgagta	180
173	gtcgtaacg gtgaggacca catggtaaag ctgcacact cgattccga cgatattgga	240
174	gcaactggttt agcctatcc tggcttgcgg catgctgtt aacgcgttag atccagcc	300
175	ggtcagacgg ccctggttt tggaggaggt cctatcgcc ttgccaccat tcttgctctg	360
176	caaggccatc atgcgggcaa aattgtgtt tccgagccgg cttgtatcag aagacagttt	420
177	gcaaaggaaac tggggctga agtgttcgtt ctttctacat gtgacgacgc aaatgtgtt	480
178	ctcaaggcta tgggtccggaa gaacgaggga ttccacgccc cttcgatga	530
180	<210> SEQ ID NO: 9	
181	<211> LENGTH: 26	
182	<212> TYPE: DNA	
183	<213> ORGANISM: Artificial Sequence	
185	<220> FEATURE:	
186	<223> OTHER INFORMATION: Artificially synthesized primer sequence	
190	<400> SEQUENCE: 9	
191	ttggcatcg atctgtcgga gcaatg	26
193	<210> SEQ ID NO: 10	
194	<211> LENGTH: 27	
195	<212> TYPE: DNA	
196	<213> ORGANISM: Artificial Sequence	
198	<220> FEATURE:	
199	<223> OTHER INFORMATION: Artificially synthesized primer sequence	
203	<400> SEQUENCE: 10	
204	ttagcatcg aatgtgttca tcaaggc	27
206	<210> SEQ ID NO: 11	
207	<211> LENGTH: 107	
208	<212> TYPE: DNA	
209	<213> ORGANISM: Pichia angusta	
211	<400> SEQUENCE: 11	
212	gaatttagcg gaacgggttgc tctgggtca caagtgtgaa acctgggtac	60
213	agagtcgcag ttgaagctac gtgcattgc tccgacagat cgcatgc	107
215	<210> SEQ ID NO: 12	
216	<211> LENGTH: 706	
217	<212> TYPE: DNA	
218	<213> ORGANISM: Pichia angusta	
220	<400> SEQUENCE: 12	
221	gcatgcaaat gctgttctca aggttatggt gccggagaac gaggattcc atgcagcctt	60
222	cgactgctct ggtgttccctc agacattcac cacctcaatt gtgcacgg gaccccttgc	120
223	aatcgccgtc aatgtggccg tttggggaga ccacccaatt ggattcatgc caatgtctct	180
224	gacttaccag gagaataacg ctaccggctc catgtgttccat accgtcaagg acttccagga	240
225	atgtgtcaag gccttggaaag atgggtctcat atctttggac aaagcgcgcgca agatgattac	300
226	aggcaaaatgtaaagg acggaggctca gaagggtttt aaacagctga tcgagcacaa	360
227	ggagaacaat gtcaagatcc tgggtacgccc gaacgagggtt tcctaaactaa taatatacat	420
228	acatcataaca tatgtatgtc cttagagccaa gacttgcgcgca ttagaaaaaa tagctggtag	480
229	tttgcattat ggtggccggc ctccccaggaa attaatctat gatttacata tggactcgat	540
230	tacgtaacag gtgtgtggca tttaataattt acctactatt ttctaaatattt gtaaaattgtt	600
231	tgtttcttgcgac gcaaggaggat atactagacg aatttcaaaa catctccaaat tgccaaatcc	660
232	ctgtgtccga acagattgcgtt tgcttagatgt ctgtgaactg gaattt	706
234	<210> SEQ ID NO: 13	
235	<211> LENGTH: 620	

RAW SEQUENCE LISTING DATE: 05/02/2002
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Input Set : A:\06501-092001.TXT
 Output Set: N:\CRF3\05022002\J020674.raw

236 <212> TYPE: DNA
 237 <213> ORGANISM: Pichia angusta
 239 <400> SEQUENCE: 13
 240 tgacattcca caccaacttc tgccgccacc actgcaatcc tgttaggcgaa caggacgatg 60
 241 caggactatt tctctatttt ttcccatcggt gcaccctgaa ccaatacggg ggaggcatgg 120
 242 gaattttcccg cgctaatcca gtcaacggta acaagaccag gatggagttt gaatatttct 180
 243 ttgacggcag cgatgaggag ttcgaggcct acttcaagtt tgccagacag gtcgcactcg 240
 244 agatatttg gctgtgtgag gcggccaaac agaaccttat aagtgggtg taccaacagg 300
 245 gcttgctgca tcctaaaaaa gaagtggggg tggttacta ccagtgcgt gttcgtgaaa 360
 246 gaataatggc ttagctccga gatgtggagg cagtctggc agactgtgcg gcaattaaat 420
 247 aagacgcgga tgtactgcac cagagtgaat aaaggaattc caattcgata gcaaataattg 480
 248 ctgtaataat gagtgaccag atttattacc gaaccttagcc agccgggggt tttttacaca 540
 249 ataggaaaaaa aaggactcga ttattcgatg ctgctgcaaa tcacgccaga cataataaagt 600
 250 caccgcgttta ctccgcgtc 620
 252 <210> SEQ ID NO: 14
 253 <211> LENGTH: 30
 254 <212> TYPE: DNA
 255 <213> ORGANISM: Artificial Sequence
 257 <220> FEATURE:
 258 <223> OTHER INFORMATION: Artificially synthesized primer sequence
 260 <400> SEQUENCE: 14
 261 tgccctgcagc gccagacata ataagtcacc 30
 263 <210> SEQ ID NO: 15
 264 <211> LENGTH: 523
 265 <212> TYPE: DNA
 266 <213> ORGANISM: Pichia angusta
 268 <400> SEQUENCE: 15
 269 ctgcagcgcc agacataata agtcacccgt ttactccgca tgcactcccc cactgatcat 60
 270 gattaatggt tctggacggc taaatcattt atcactgcgt cccggaccc tcgtaccgacgt 120
 271 gggaaatttagc cggcactcgg ttgtgagaga ttatcctata taaaccacaa aatcctatct 180
 272 ccctttgcc aatgaaaggt ttactttatt acggtaaaaa cgtatccgc tactccgaaa 240
 273 cggttccctga accggagatc aagaatccca acgatgtcaa gatcaaagtc agctattgtg 300
 274 gatatctgtgg cacggacttg aaagaattca catattctgg aggtccgtt tttttccctta 360
 275 aacaaggcac caaggacaag atttcgggat acgaacttcc tctctgtcct ggacatgaat 420
 276 tttagcggaaac ggtggtcgag gttggctctg gtgtcacaag tgtgaaacct ggtgacagag 480
 277 tgcgcgttga agctacgtcg cattgctccg acagatcgca tgc 523
 279 <210> SEQ ID NO: 16
 280 <211> LENGTH: 30
 281 <212> TYPE: DNA
 282 <213> ORGANISM: Artificial Sequence
 284 <220> FEATURE:
 285 <223> OTHER INFORMATION: Artificially synthesized primer sequence
 287 <400> SEQUENCE: 16
 288 tgctcatgaa aggtttactt tattacggta 30
 290 <210> SEQ ID NO: 17
 291 <211> LENGTH: 28
 292 <212> TYPE: DNA
 293 <213> ORGANISM: Artificial Sequence
 295 <220> FEATURE:

RAW SEQUENCE LISTING ERROR SUMMARY DATE: 05/02/2002
PATENT APPLICATION: US/10/020,674 TIME: 15:37:08

Input Set : A:\06501-092001.TXT
Output Set: N:\CRF3\05022002\J020674.raw

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:6; N Pos. 6,9,15,18

Seq#:7; N Pos. 9,12

VERIFICATION SUMMARY
PATENT APPLICATION: US/10/020,674

DATE: 05/02/2002
TIME: 15:37:08

Input Set : A:\06501-092001.TXT
Output Set: N:\CRF3\05022002\J020674.raw

L:14 M:271 C: Current Filing Date differs, Replaced Current Filing Date
L:142 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:146 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:6
L:147 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:6 after pos.:0
L:157 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:161 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:7
L:162 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7 after pos.:0